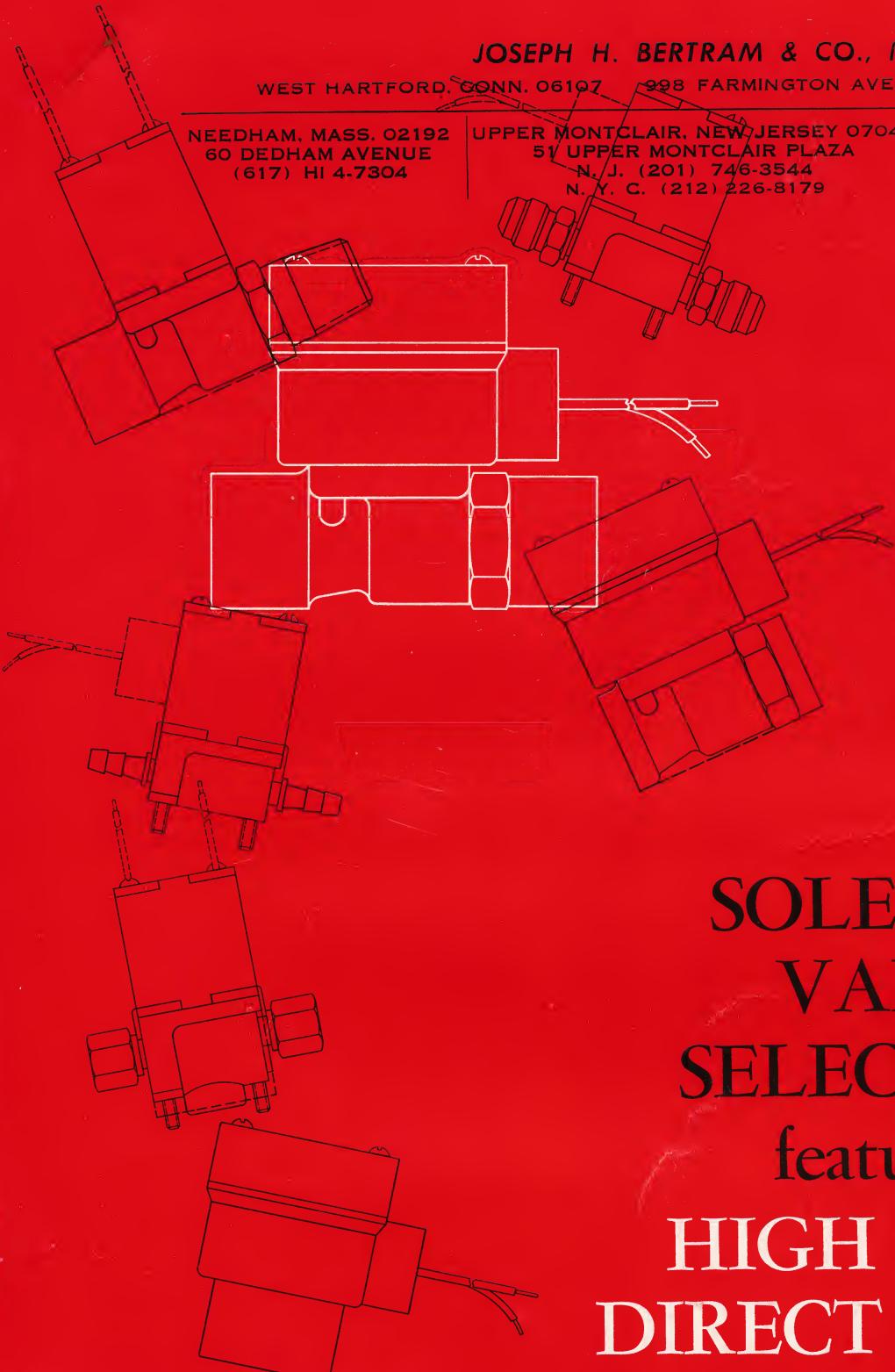


## JOSEPH H. BERTRAM &amp; CO., INC.

WEST HARTFORD, CONN. 06107 998 FARMINGTON AVENUE (203) 521-2300

NEEDHAM, MASS. 02192  
60 DEDHAM AVENUE  
(617) HI 4-7304UPPER MONTCLAIR, NEW JERSEY 07043  
51 UPPER MONTCLAIR PLAZA  
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1654 CENTRAL AVENUE  
(518) 436-4100

**SOLENOID  
VALVE  
SELECTIONS**  
*featuring*  
**HIGH FLOW\***  
**DIRECT ACTING**  
**DESIGNS**



\*Patented Floating Seal Principle

## "F.S." (FLOATING SEAL)

**DESCRIPTION** In conventional designs, the seat is usually an integral part of the body. It is machined or molded as part of the body construction. In "F.S.", the body only acts as an envelope. It is a package used to position the precision parts or assist certain static functions. The seat is made of stainless steel and is inserted into the body and pinned or locked into position. The Plunger, instead of being flat-bottomed, has a flat webbed effect on that end with a hole through it. The seal is usually of a non-resilient material. Frequently, it is of an impervious carbon graphite. However, it can be made of various metals or plastics as well. The Seal Disc rides loosely in the webbed end of the Plunger. Thus, the assembly, in turn, is inserted at right angles to the Seat. These parts and the assembly are clearly illustrated further along in this introduction. This bore is almost closed off on one end. The Seal Disc is then captive on one side stopped by the Seat, and on the other side by the restriction of the Plunger itself.

Now that you have the basic assembly, the Seal is affected in the following manner: The Seat is optically flat. The flatness is so precise that it measures well under  $\frac{1}{2}$  of one light band of flatness. The Seal Disc, in turn, is also flattened or lapped to the same degree. Bringing together two "flats" like this gives a very effective seal. It is much like putting together a set of Jo Blocks. The "drag" effect is eliminated by using dissimilar materials having low co-efficients of friction. The Seal Disc is a loose part in the Plunger so that it can move freely. Having wide tolerance, it will always move in a position that lines up with the Seat, allowing the "flats" to mate perfectly. This movement is the result of pressure differential. Pressure applied to the inlet of the valve will cause the Seal Disc to move over and up against the Seat. The Seal Disc, being bigger than the orifice in the Seat, covers the hole easily and thus stops the flow from passing on through the valve. To open the valve we energize the Coil—create a magnetic field and lift the plunger-carrying Seal Disc out of the way. This uncovers the orifice, and flow commences. The de-energizing of the solenoid allows the spring-loaded Plunger to drop back like a gate. The Seal Disc moves over and the flow shuts off.

**STRAIGHT THROUGH FLOW** The position of the Seats provide us with a Straight Through Flow. The Plunger Seal intersects this flow line. When the valve is in an open position, you can look straight through to the other side. This is what we call a true "in line" flow configuration. This is as opposed to the circuitous path in valves of more conventional configuration. This principle of Straight In-line Flow has a marked effect on the flow capacity of the valve. Anything that comes in contact with the flow of media, affects it. Simply stated—everything in its path tends to reduce the rate of flow. The very pipe itself does this. To a greater degree, the presence of right-angle fittings, restrictors, regulators, valves, etc., complicate this. A valve with a circuitous path is one more item in a system that must be reckoned with. However, the problem is greatly alleviated when a Straight Through valve can be used. Using a rough, rule of thumb to illustrate, you need a  $3/16$ " Poppet to equal a  $1/8$ " "F.S.". A  $3/8$ " Poppet or diaphragm is easily surpassed by a  $5/16$ " "F.S.". This factor is about a 50% greater efficiency through the use of "F.S.". Size for size, an "F.S." valve al-

ways provides greater flow. Another benefit, is the higher pressure rating as related to flow capacity. Example: if we lift off our  $1/8$ " orifice, we can rate our valve to a higher pressure and so end having to lift a standard construction off a  $3/16$ " orifice. This holds true for all sizes.

**CONTAMINATION** Here is another area where the "F.S." is hard to beat. The Seal Disc, being used in a gate-type action, becomes in effect, a guillotine. This sealing principle prevents foreign matter from becoming lodged on the seat and then being impinged by the plunger. In this case, each time the valve is actuated, it cleans the seat by wiping it and at the same time eliminating all foreign matter that may be present at that time. To the best of our knowledge, there is no other valve designed that surpasses or equals the "F.S." for handling contaminated media.

## ELECTRICAL DATA

For those valves shown with a 10 Watt rating, the following information is applicable.

All valve part numbers listed are for 115V/60 cycles. A variety of voltages is available, (see listing below), and are interchangeable in all valves which are rated for 10 Watts. Other voltages in the 15 and 21 Watt category are available, but it will be necessary to contact Valcor for assistance.

The following chart gives you the correct Coil number to be used in the model number: Example 11C19C4-5. The first C (conduit), or P (pigtail), is followed by the coil number. In this case, the number 19 indicates that this valve has a molded 115V/60 cycle coil. If you wanted this valve with a 220V/60 cycle coil, you would substitute number 3 for the 19. The part would now read 11C3C4-5 and would be rated for the new voltage.

Direct Current voltages are available only on special order. Please contact Valcor for such assistance.

## 10 WATT\* COIL SELECTION CHART

VOLTAGE	COIL P/N	Molded	Standard	INRUSH Amps	HOLDING Amps
12V/60 cycle	9		X	2.800	1.100
12V/60 cycle	10	X		2.800	1.100
24V/60 cycle	51		X	1.900	.670
24V/60 cycle	52	X		1.900	.670
24V/50 cycle	11		X	1.900	.670
24V/50 cycle	12	X		1.900	.670
48V/60 cycle	53		X	.710	.340
48V/60 cycle	54	X		.710	.340
115V/60 cycle	18		X	.380	.152
115V/60 cycle	19	X		.380	.152
115V/50 cycle	17		X	.280	.130
115V/50 cycle	20	X		.280	.130
220V/60 cycle	3		X	.175	.085
220V/60 cycle	4	X		.175	.085
220V/50 cycle	13		X	.180	.088
220V/50 cycle	14	X		.180	.088
440V/60 cycle	5		X	.100	.036

**STANDARD COIL.** Suitable for temperatures of up to 180°F. This is a Class "A" Coil, varnish impregnated, built to UL, NEMA, AIEE, and other industry standards.

**MOLDED COIL.** Suitable for temperatures of up to 212°F. For use under severe moisture conditions. Entire Coil is molded in epoxy resin, built to UL, NEMA, AIEE, and other industry standards.

**15 and 21 WATT COILS.** The coils so-designated, are actually of Class "H" construction. They may be used in high temperature application, handling fluids up to 300°F. These are wound of silicone wire. All insulation, tape and lead wire are made with Teflon coated fiberglass. Class "H" coils should not be specified unless all rubber parts (seals, etc.) are also specified for high temperature. This coil, besides being designed for high temperature, has an exceptionally long life and may be selected where coil reliability is paramount.

The amperage rating at 115V/60 cycles is as follows:

21 Watts: Inrush = .710 Amps

Holding = .350 Amps

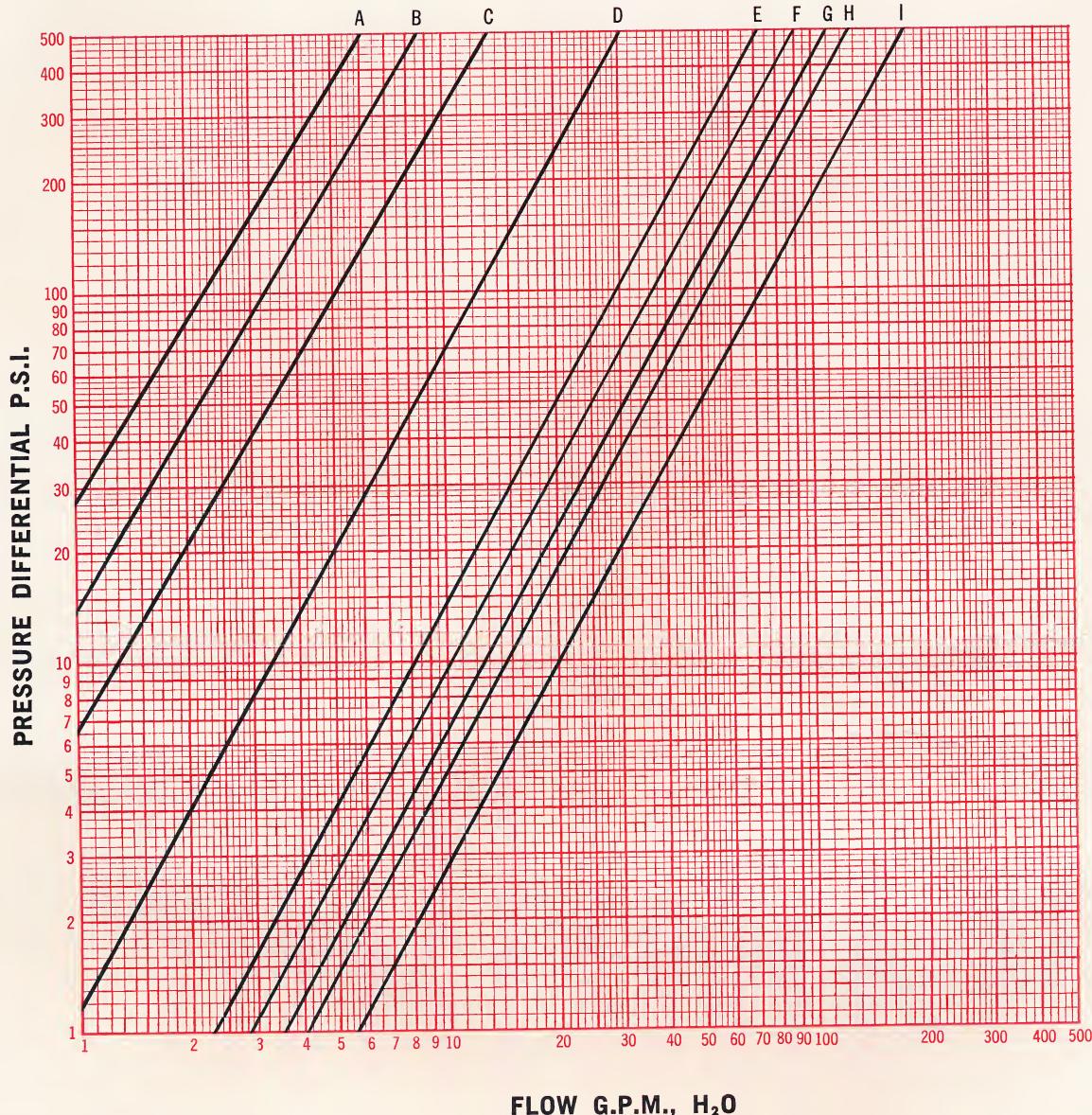
15 Watts: Inrush = .590 Amps

Holding = .260 Amps

**EXPLOSION-PROOF HOUSING.** Built to withstand any pressure developed by an explosive atmosphere. Also, any internal-flame cannot be propagated to the external atmosphere.

\*For other voltages in the 15 and 21 Watt type, it will be necessary to contact Valcor Engineering Corporation for assistance.

## WATER FLOW CURVE



### **ORDERING INFORMATION**

Alongside of each model number, the features applicable are indicated by check marks. The price, which is also indicated on the same line, incorporates all those features checked.

All prices shown, or computed, are Net. Shipments are made F.O.B., Kenilworth, New Jersey. Terms are net 30 days. Quantity discounts are available. Write to the factory for this information. All orders are subject to acceptance by the Home Office of Valcor Engineering Corporation. Also, Valcor reserves the right to change prices or designs without prior notice.

### **SHIPMENTS**

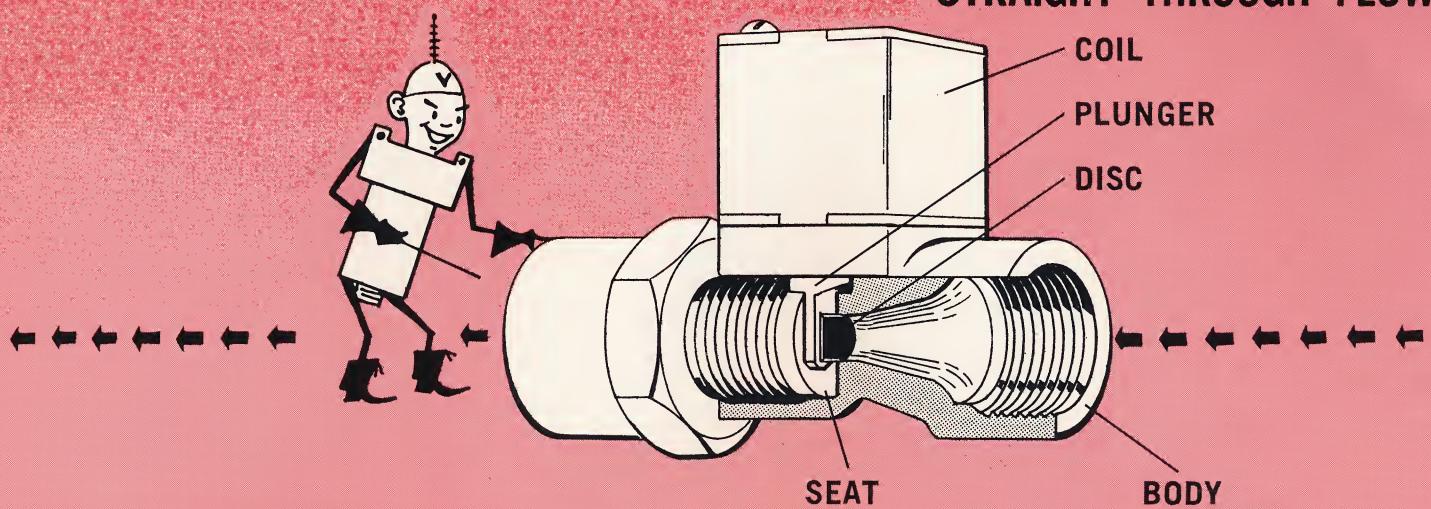
Unless shipping method is specified, Valcor, at its own discretion, will ship by means it considers suitable on the basis of time, distance, weight and value of the shipment.

### **WARRANTY**

The valves listed herein are warranted to be free from defects in workmanship or material, under normal use, for a period of one year from date of shipment from Valcor. This warranty is limited to the repair or replacement of the valve, or part thereof, which we find defective.

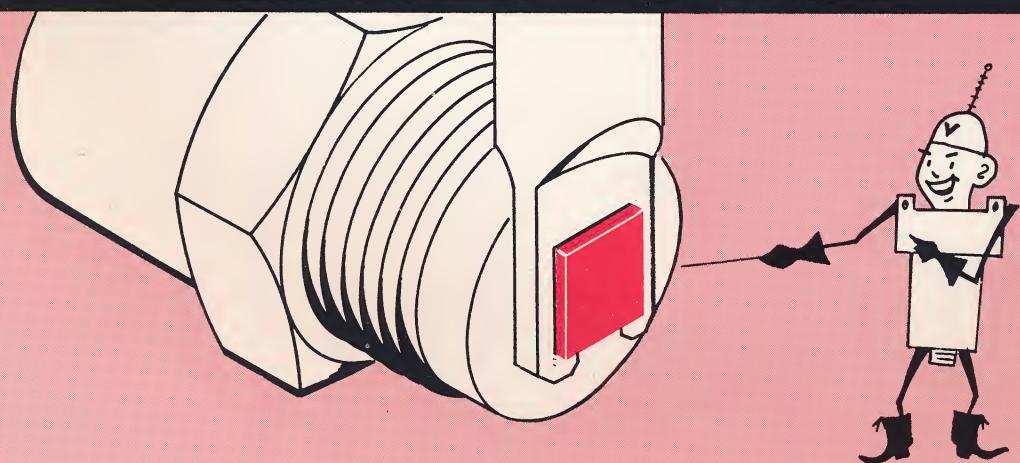
Valcor assumes no liability for consequential damage of any kind. The purchaser, by acceptance of these products, assumes all liability of the consequences of their use or misuse.

## STRAIGHT THROUGH FLOW



## BASIC PARTS OF FLOATING SEAL

The exact shape of the plunger, disc and seat can vary, depending upon the particular valve model.



## Absolute Minimum Pressure Drop.

In many of today's applications the flow requirement is greater than that available in a given line size, when using conventional valving. The flow requirement is higher than the valve can handle without high pressure drop. The Valcor FLOATING SEAL Valve has a path of flow which is directly in line with the tubing or connection to either side of the valve. As a result the added resistance to the system is not much greater than if you had the same piece of pipe continuing straight through. Adding a Valcor Floating Seal Valve to a given system doesn't add much more resistance than an equal length of tubing.

## The Valcor Floating Seal

- SIMPLICITY OF DESIGN, NO NEED FOR PRECISION FITS.
- IMPROVES WITH USE BECAUSE OF SELF-LAPPING ACTION.
- SELF-CLEANING, EXCELLENT FOR CONTAMINATED SYSTEMS.

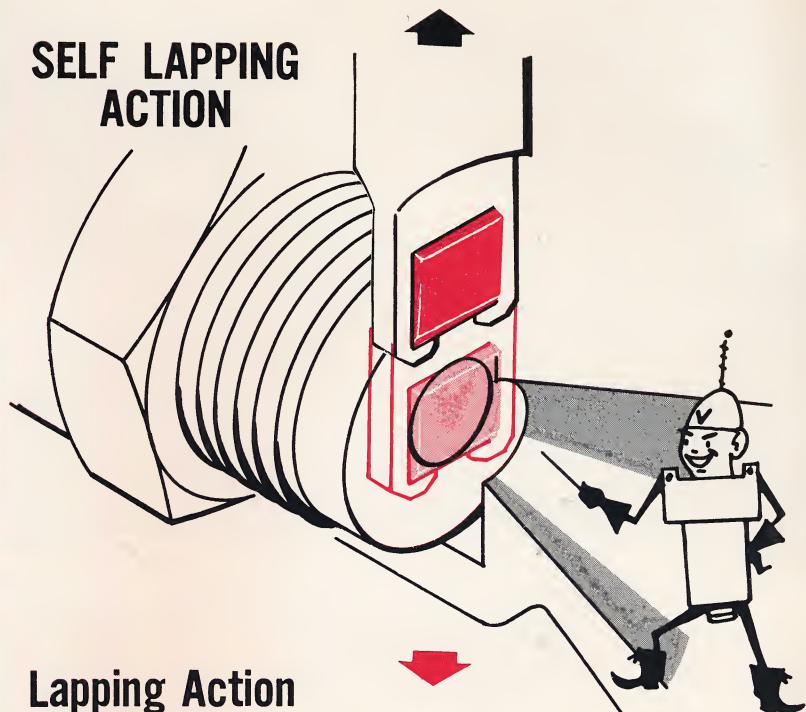
The Valcor Floating Seal Valve consists of three basic parts—the plunger, disc and valve seat which are positioned in a housing (Body). The Valve is designed so that these parts are removable, and easily replaced, as is the coil. The seat and fitting are usually loose inserts in the body; the plunger is a loose insert in the cylinder; and the seal disc is a loose insert in the plunger. The actuating mechanism (solenoid) is completely independent of the body itself.

The plunger is flattened at one end with a hole, or opening, in it. The seal disc is retained in this opening. This disc is the sealing element itself and is free-floating. It is usually made of an inert material such as Carbon, Teflon or metal. When it is in sealing position, pressure differential holds the seal disc against the seat. The surfaces of the disc and seat are optically flat so that a perfect contact and seal are effected.

## Loose Fit

THE THREE BASIC PARTS ARE SHOWN HERE ASSEMBLED IN THEIR RELATIVE POSITIONS. THE SEAT IS A LOOSE INSERT IN THE BODY, THE PLUNGER IS A LOOSE INSERT IN THE PLUNGER CYLINDER, AND THE DISC IS A LOOSE INSERT IN THE PLUNGER.

## SELF LAPPING ACTION



## Lapping Action

As the valve is cycled the lapping action between the disc and seat improves the seal. Multi-million cycles have been recorded in liquid system applications. Under such conditions, the wear is almost impossible to measure. Pressure differential will float the disc against the seat and thereby effect a seal. Valve may be mounted in any position.



## SELF CLEANING

## Dependability Under Adverse Conditions.

One of the major advantages of the Valcor Floating Seal design is that it operates efficiently even under conditions of severe contamination. The face of the seat is always wiped clean as the plunger carrying the disc moves up and down. It cannot become a trap for contaminants. Extensive tests, plus over 14 years of field usage, proves that the free-wiping action between the disc and the seat can prevent any interference with the operation of the valve.

# SERIES SV-11 and SV-12

**1/4" LINE SIZE  
DIRECT ACTING  
NO MINIMUM PRESSURE DROP  
REQUIRED**

## CONSTRUCTION

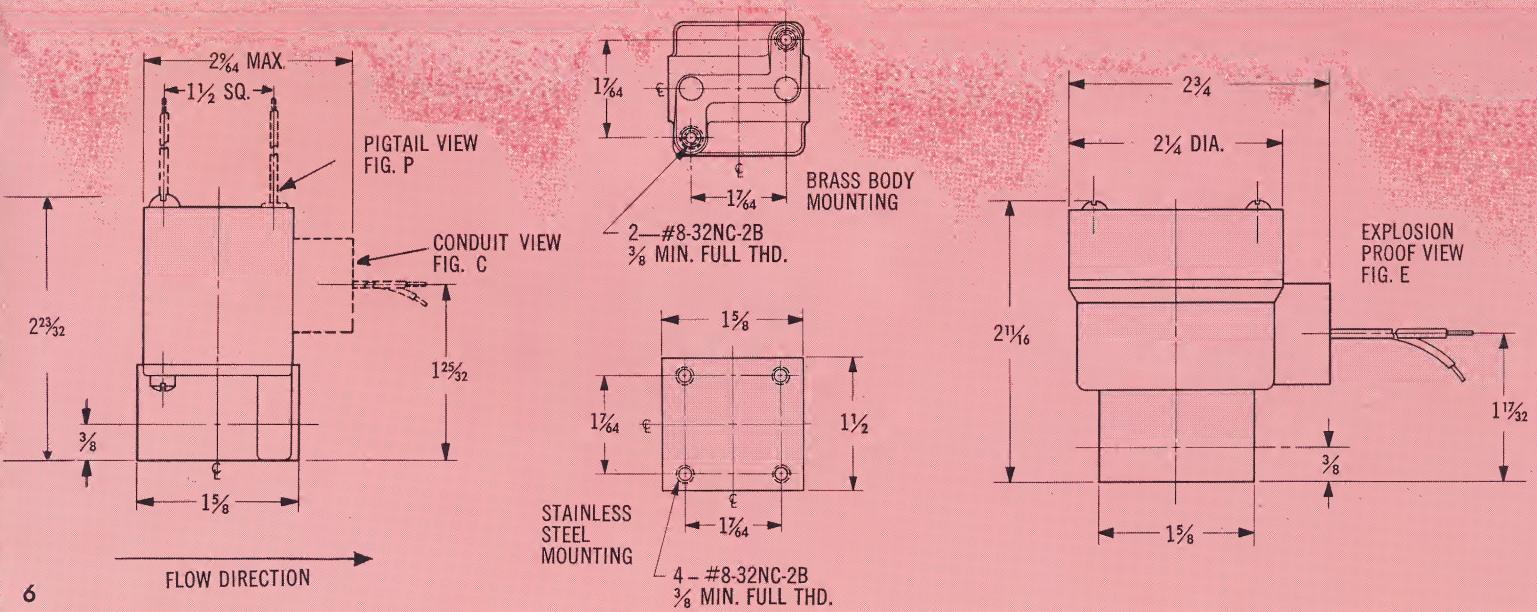
**Body: Brass or Stainless Steel  
Internal: Stainless Steel  
Seal: Teflon to Stainless Steel  
Shading Coil: Silver**

## ELECTRICAL

**Power: 10 Watts Maximum  
Voltage: 115V/60 Cycle  
See Page 2 for Other Ratings  
Duty: Continuous**

**NORMALLY CLOSED ONLY**

Max. Press.	STAINLESS STEEL			Coil						BRASS	
	Part Number	Price	Flow Curve	Conduit		Pigtail		Exp. Proof	Fig.	Price	Part Number
				Mld.	Std.	Mld.	Std.				
125 PSIG	11C19C4-5	\$27.00	D	X					C	\$15.00	12C19C4-5
	11P19C4-5	26.50			X				P	14.50	12P19C4-5
	11C19C4-5E	33.50		X				X	E	21.50	12C19C4-5E
	11C18C4-5	26.00			X				C	14.00	12C18C4-5
	11P18C4-5	25.50					X		P	13.50	12P18C4-5
200 PSIG	11C19C4-3	27.00	C	X					C	15.00	12C19C4-3
	11P19C4-3	26.50			X				P	14.50	12P19C4-3
	11C19C4-3E	33.50		X				X	E	21.50	12C19C4-3E
	11C18C4-3	26.00			X				C	14.00	12C18C4-3
	11P18C4-3	25.50					X		E	13.50	12P18C4-3
500 PSIG	11C19C4-2	27.00	B	X					C	15.00	12C19C4-2
	11P19C4-2	26.50			X				P	14.50	12P19C4-2
	11C19C4-2E	33.50		X				X	E	21.50	12C19C4-2E
	11C18C4-2	26.00			X				C	14.00	12C18C4-2
	11P18C4-2	25.50					X		P	13.50	12P18C4-2
1000 PSIG	11C19C4-1	27.00	A	X					C	15.00	12C19C4-1
	11P19C4-1	26.50			X				P	14.50	12P19C4-1
	11C19C4-1E	33.50		X				X	C	21.50	12C19C4-1E
	11C18C4-1	26.00			X				E	14.00	12C18C4-1
	11P18C4-1	25.50					X		P	13.50	12P18C4-1



# SERIES SV-34, SV-35 and SV-36

1/4" AND 3/8" LINE SIZES

DIRECT ACTING  
NO MINIMUM PRESSURE DROP  
REQUIRED

## CONSTRUCTION

Body: Brass or Nylon  
Internal: Stainless Steel  
Fittings: Stainless Steel  
Seal: Carbon Graphite to Stainless Steel  
Shading Coil: Silver

## ELECTRICAL

Power: See Ratings Below

Voltage: 115V/60 Cycle

See Page 2 for Other Ratings

Duty: Continuous

Explosion Proof Available

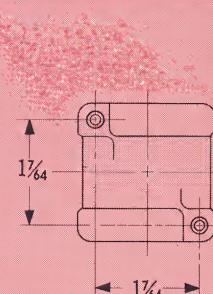
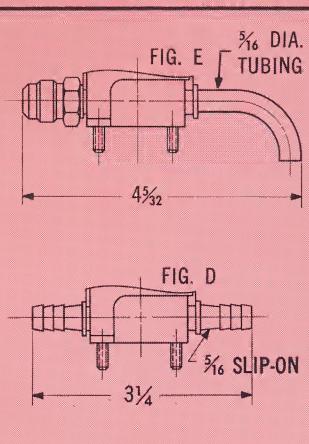
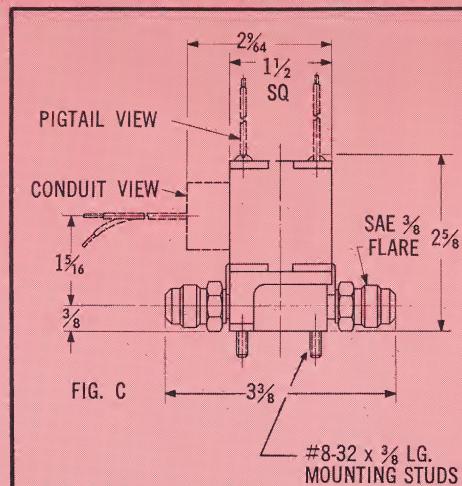
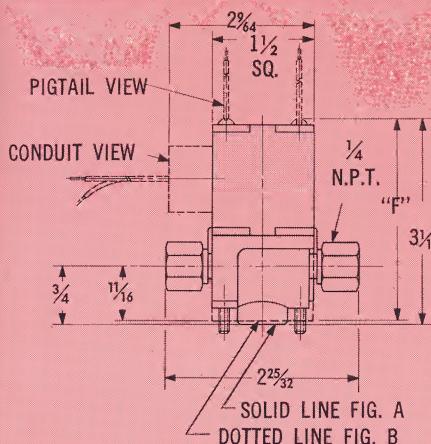
### NORMALLY OPEN

Press.	Part Number	Price	Porting	Body	Fig.	Coil		Watts	Flow Curve	C <sub>v</sub>
						Mld.	Std.			
100 PSIG	*34C890-4F	\$49.50	1/4" FNPT X 1/4" FNPT	Brass	B	X		21 Max.	F	2.6
50 PSIG	*35C890-4F	43.00					X	15 Max.		
	35C190-4F	36.50					X	10 Max.		
	36C190-4F	23.00		Nylon	A	X				

\*Suitable for fluid temperature of 300°F.

### NORMALLY CLOSED

Press.	Brass Part Number	Price	Porting	Fig.	10 Watt Coil				Flow Curve	Price	Nylon Part Number
					Conduit	Pigtail	Mld.	Std.			
50 PSIG	35C19C-6M	\$17.50	3/8" Male Flare X 3/8" Male Flare	C	X				F	\$16.50	36C19C-6M
	35C18C-6M	16.50				X				15.50	36C18C-6M
	35P19C-6M	17.00					X			16.00	36P19C-6M
	35P18C-6M	16.00						X		15.00	36P18C-6M
50 PSIG	35C19C-6S	16.25	5/16" Slip-on X 5/16" Slip-on	D	X				F	15.25	36C19C-6S
	35C18C-6S	15.25				X				14.25	36C18C-6S
	35P19C-6S	15.75					X			14.75	36P19C-6S
	35P18C-6S	14.75						X		13.75	36P18C-6S
50 PSIG	35C19C-6X	18.00	5/16" Nozzle X 3/8" Male Flare	E	X				F	17.00	36C19C-6X
	35C18C-6X	17.00				X				16.00	36C18C-6X
	35P19C-6X	17.50					X			16.50	36P19C-6X
	35P18C-6X	16.50						X		15.50	36P18C-6X



DIM. "F" = 3" WITH 10 WATT AND 15 WATT COILS  
DIM. "F" = 3 3/32" WITH 21 WATT COIL

# SERIES SV-15 and SV-16

**1/2" LINE SIZE  
DIRECT ACTING  
NO MINIMUM PRESSURE DROP  
REQUIRED**

## CONSTRUCTION

Body: Brass or Stainless Steel  
Internal: Stainless Steel  
Seal: Teflon to Stainless Steel  
Shading Coil: Silver

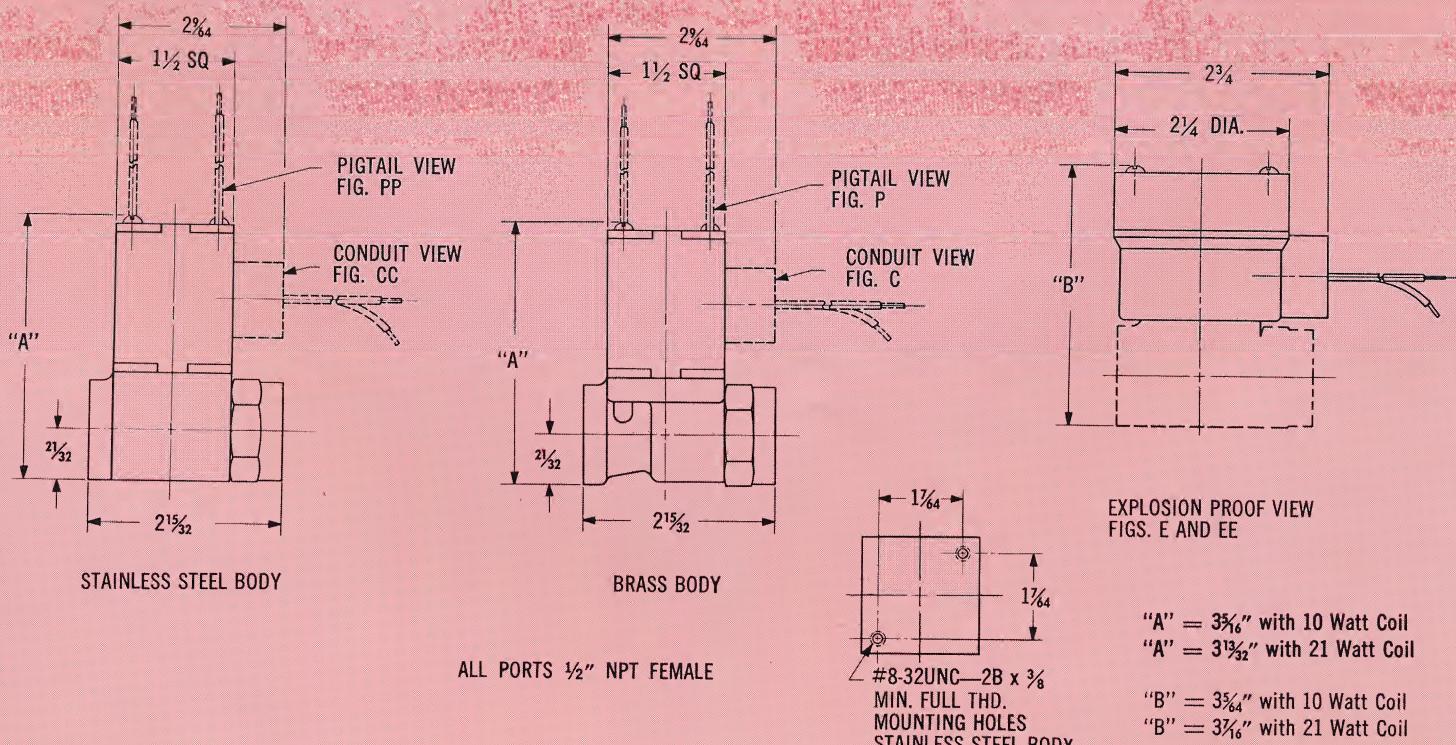
## ELECTRICAL

Voltage: 115V/60 Cycle  
See Page 2 for Other Ratings  
Coil: Epoxy Molded  
Duty: Continuous

**NORMALLY CLOSED ONLY**

Max. Press.	STAINLESS STEEL				21 Watt Coil *				BRASS			
	Part Number	Price	Fig.	Flow	C <sub>v</sub>	Pigtail	Conduit	Exp. Proof	Fig.	Price	Part Number	
200 PSIG	15C89C8-4	\$73.00	CC	E	2.2	X			C	\$37.00	16C89C8-4	
	15C89C8-4E	83.50	EE			X	X	X				
	15P89C8-4	72.50	PP			X						
125 PSIG	15C89C8-5	73.00	CC	G	3.9	X			C	37.00	16C89C8-5	
	15C89C8-5E	83.50	EE			X	X	X				
	15P89C8-5	72.50	PP			X						
75 PSIG	15C19C8-4	60.00	CC	E	2.2	X			C	24.00	16C19C8-4	
	15C19C8-4E	66.50	EE			X	X	X				
	15P19C8-4	59.50	PP			X						
30 PSIG	15C19C8-5	60.00	CC	G	3.9	X			C	24.00	16C19C8-5	
	15C19C8-5E	66.50	EE			X	X	X				
	15P19C8-5	59.50	PP			X						

\* Suitable for maximum fluid temperature of 300°F.



# SERIES SV-17, SV-18, SV-77 and SV-88

**3/4" LINE SIZE  
DIRECT ACTING  
NO MINIMUM PRESSURE DROP  
REQUIRED**

## CONSTRUCTION

Body: Brass or Stainless Steel  
Internal: Stainless Steel  
Seal: Teflon to Stainless Steel  
Shading Coil: Silver

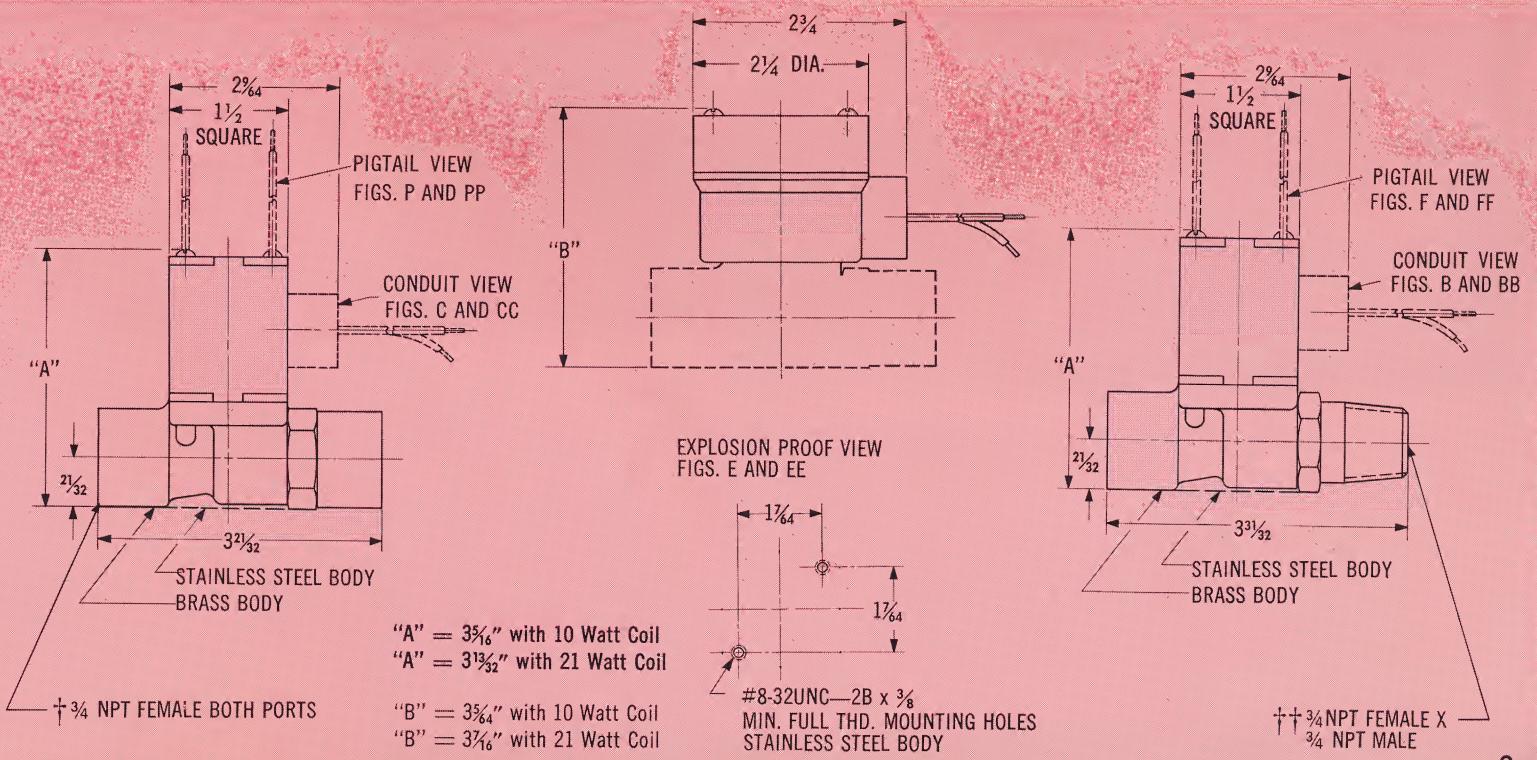
## ELECTRICAL

Voltage: 115V/60 cycle  
See Page 2 for Other Ratings  
Coil: Epoxy Molded  
Duty: Continuous

**NORMALLY CLOSED ONLY**

STAINLESS STEEL				21 Watt Coil *				BRASS			
Max. Press.	Part Number	Price	Fig.	Flow	C <sub>v</sub>	Pigtail	Conduit	Exp. Proof	Fig.	Price	Part Number
125 PSIG	17C89C9-5	\$81.00	CC	H	4.2	X			C	\$45.00	18C89C9-5
	17C89C9-5E	91.50	EE			X	X		E	55.50	18C89C9-5E
	17P89C9-5	80.50	PP			X			P	44.50	18P89C9-5
125 PSIG	77C89C9-5	81.00	BB	I	5.6	X			B	45.00	88C89C9-5
	77C89C9-5E	91.50	EE			X	X		E	55.50	88C89C9-5E
	77P89C9-5	80.50	FF			X			F	44.50	88P89C9-5
30 PSIG	17C19C9-5	68.00	CC	H	4.2	X			C	32.00	18C19C9-5
	17C19C9-5E	74.50	EE			X	X		E	38.50	18C19C9-5E
	17P19C9-5	67.50	PP			X			P	31.50	18P19C9-5
30 PSIG	77C19C9-5	68.00	BB	I	5.6	X			B	32.00	88C19C9-5
	77C19C9-5E	74.50	EE			X	X		E	38.50	88C19C9-5E
	77P19C9-5	67.50	FF			X			F	31.50	88P19C9-5

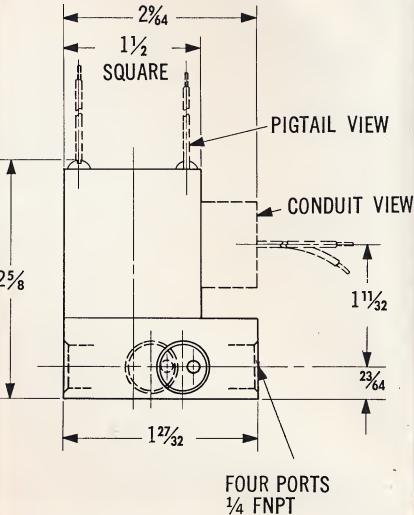
\*Suitable for maximum fluid temperature of 300°F.



# SERIES SV-1000

Four Way, 1/4 FNPT, Brass, All Ports in Body,  
Compact and Fast Acting

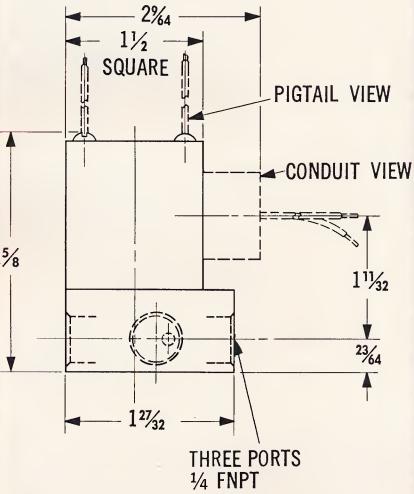
Press.	Part Number	Price	Flow Rating	Coil				Exp. Proof	
				Conduit		Pigtail			
				Mld.	Std.	Mld.	Std.		
125 PSIG	SV-1000-1	\$18.00	De-energized Pressure to Cyl. #1 $C_v = .105$ Cyl. #2 to Exhaust $C_v = .116$  Energized Cyl. #1 to Exhaust $C_v = .120$ Pressure to Cyl. #2 $C_v = .112$			X			
	SV-1000-2	19.00				X			
	SV-1000-3	18.50			X				
	SV-1000-4	19.50		X					
	SV-1000-14	26.00		X			X		
	SV-1000-15	25.00			X		X		



# SERIES SV-900

Three Way, 1/4 FNPT, Brass, All Ports in Body,  
Available Normally Open or Normally Closed

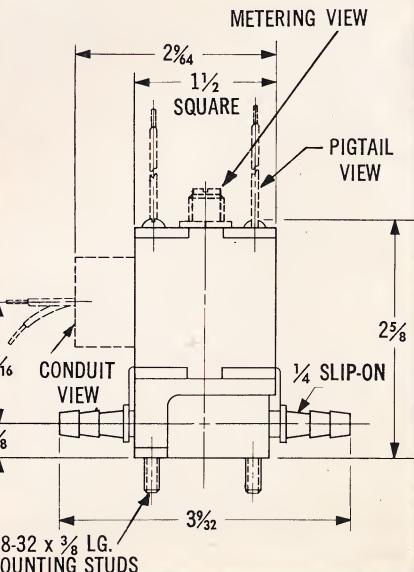
Press.	Part Number	Price	Flow Rating	Coil				Exp. Proof	
				Conduit		Pigtail			
				Mld.	Std.	Mld.	Std.		
125 PSIG	SV-900-1	\$12.75	De-energized Cyl. #1 to Exhaust $C_v = .120$			X			
	SV-900-2	13.75				X			
	SV-900-3	13.25			X				
	SV-900-4	14.25		X					
	SV-900-19	20.75		X			X		
	SV-900-20	13.25	Energized Pressure to Cyl. #1 $C_v = .105$  De-energized Pressure to Cyl. #1 $C_v = .105$		X				
	SV-900-21	14.25		X					
	SV-900-22	20.75		X			X		
	SV-900-23	13.75			X				
	SV-900-24	12.75				X			



# SERIES SV-3700

Two Way, Normally Closed, Plastic Body Stainless  
Fittings • Metering Control, Special Fittings Optional  
• Ideal for Vending Equipment

Press.	Part Number	Price	Flow Curve	Fittings	Metering	Coil				#8-32 x 3/8 LG. MOUNTING STUDS	
						Conduit		Pigtail			
						Mld.	Std.	Mld.	Std.		
125 PSIG	SV-3700-5	\$14.00	C	1/4" Slip-on Fittings Both Ends	X		X			#8-32 x 3/8 LG. MOUNTING STUDS	
	SV-3700-6	13.50			X				X		
	SV-3700-7	12.50				X					
	SV-3700-8	12.00						X			
	SV-3700-41	13.00						X			
	SV-3700-43	13.50				X					
	SV-3700-44	14.50			X			X			
	SV-3700-45	15.00			X	X					



# VALCOR'S LIBRARY of VALVE INFORMATION



## CATALOG 110 VALVES FOR GENERAL PURPOSE APPLICATIONS

These are 2-way and 3-way direct-acting poppet valves, available with either brass or nylon bodies. Orifice sizes range from 3/64" to 1/4"; pressure ratings range from vacuum to 450 PSI. Constructed with stainless steel internal parts, these valves are suitable for air, oil, water, gases, freon and many semi-corrosive media. These are competitively priced for the OEM market.

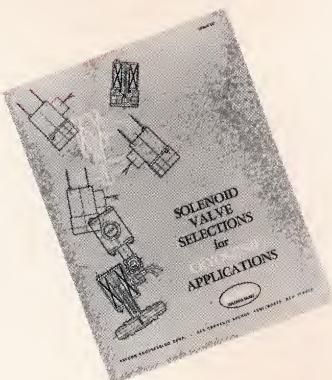
## CATALOG 108C VALVES FOR CORROSIVE APPLICATIONS

These are 2-way N/O and N/C direct-acting diaphragm valves, available with either Teflon, Nylon or Polypropylene bodies and Neoprene, Viton, Teflon or Butyl diaphragms. Orifice sizes range from 1/16" to 17/32"; pressure ratings range from vacuum to 130 PSI; line sizes from 1/4" to 1/2". These valves are suitable for a wide range of corrosive, abrasive and sanitary applications. Unique valve construction eliminates contact between fluid and any metal.



## CATALOG 112 VALVES FOR CRYOGENIC APPLICATIONS

These are 2-way N/O and N/C direct-acting poppet and floating-seal valves, available with either brass or all-welded stainless steel bodies. Orifice sizes range from 3/64" to 3/8"; pressure ratings to 1000 PSI. These valves are suitable for liquid nitrogen, oxygen, hydrogen, helium and carbon dioxide plus other cryogenic fluids.



## CATALOG M-109 VALVES FOR AERO-SPACE APPLICATIONS

This catalog covers an extensive range of 2-way, 3-way and 4-way valves, especially designed for missile, satellite, aircraft, ground support and nuclear applications. Temperatures range from -455°F to 2300°F. Almost every airborne device either has a Valcor valve on it or is supported in some way by a Valcor valve, from the latest jet airliners to our most advanced space vehicles.



We invite you to request any of the above catalogs. Please contact our Marketing Department for prompt handling of your requests.

Valcor solenoid valves have been accepted as the standard of industry for applications involving extremes of temperature, pressure, flow and corrosion. Whether your application is general purpose or exotic, your requirements will receive the attention of valve builders whose experience and capabilities are unsurpassed.



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